Solar Magnetism

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Here is my take on solar magnetism, see Figure 1 (left to right, top to bottom) along with the text.

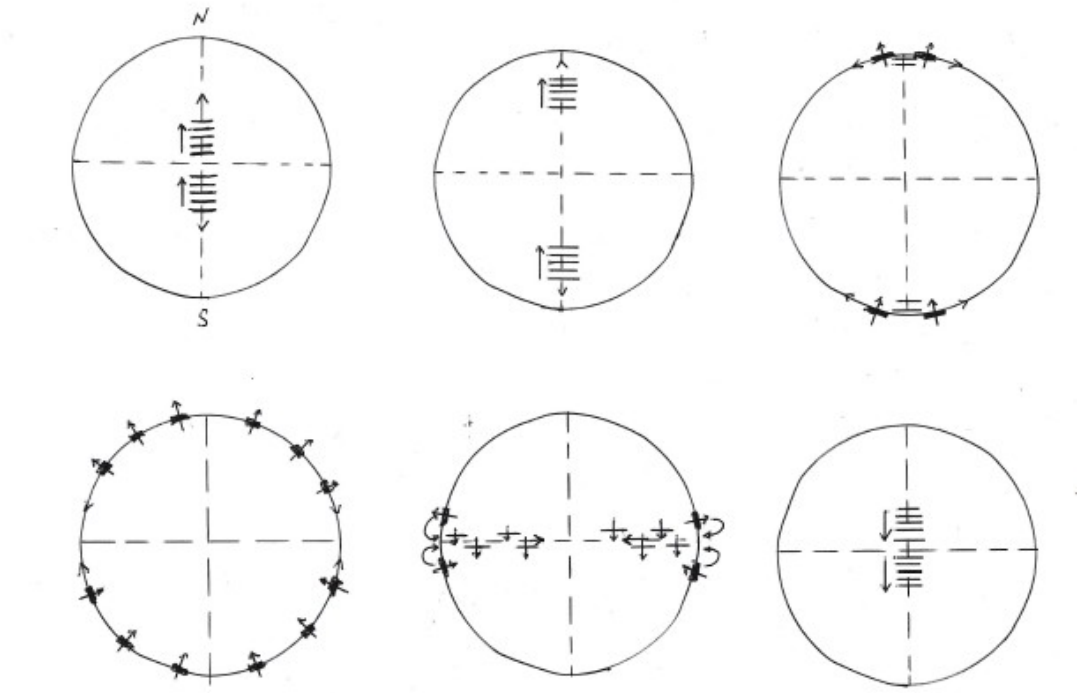

Figure 1

In Sun's interior, along the polar axis, there is a stack of ring currents producing Sun's magnetic field.

A convective center upflow draws this stack towards the poles.

When the stacks hit the poles, current rings move out on the surface forming sunspots

A convective surface downflow brings sunspots towards the equator

At the equator, sunspots are subducted, *inverting their polarity*, and transported back to the center.

At the center, current rings reconstruct the stack and the cycle restarts with *inverted* polarity.

The ring currents are thermodynamic (superconducting) currents which rely on a lowering of free enthalpy due to their presence. This requires Sun's matter to be *paramagnetic*.